

Section 12 — Nowlin Lattice Force Equation (NLF): ϕ -Weighted Torsion–Phase Dynamics

Section 12 formalizes the Nowlin Lattice Force Equation (NLF), the core mathematical law governing all lattice-scale motion, torsion, and transport in the FUNt framework. The NLF unifies magnetic, torsional, buoyant, and scalar-field forces under one ϕ -weighted angle–phase expression. It describes how motion, acceleration, and torque emerge from lattice geometry rather than from classical force fields.

12.1 Definition of the Nowlin Lattice Force Equation

- The NLF expresses force as a harmonic product of: (1) phase angle $\Delta\phi$, (2) coherence $\bar{\kappa}$, (3) harmonic torque coefficient K_h .
- In its base form derived from machine behavior tests: $\tau \approx 0.866 \cdot K_h \cdot \bar{\kappa}$.
- $0.866 = \sqrt{3}/2$ corresponds to the 60° HRB discipline angle used across FUNt.
- The NLF replaces classical force-laws with ϕ -structured energy exchange.
- [Insert NLF diagram here]

12.2 ϕ -Weighting and Phase Geometry

- Force increases with ϕ -weighted phase alignment.
- $\Delta\phi = 60^\circ$ ($\pi/3$ rad) is the optimal mechanical coupling angle across resonant systems.
- ϕ^7 sets the coherence ceiling for force transmission before inversion.
- Phase reversal at ϕ^9 creates scalar-drop conditions.
- [Insert phase geometry diagram here]

12.3 Magnetic–Torsion Dual Representation

- Magnetic behavior (electron side) and torsional behavior (proton side) are mirrored expressions of NLF.
- Electron buoyant modes follow ϕ^1 – ϕ^3 scaling.
- Proton torsional modes follow ϕ^3 – ϕ^6 scaling.
- Both converge at ϕ^7 where torque becomes emissive (photon-like).
- [Insert dual representation diagram here]

12.4 Lattice Transport and Acceleration

- Acceleration arises from stepping between ϕ^n rungs, not from external forces.

- Higher φ increases acceleration up to φ^7 ; above φ^7 acceleration becomes photon-like.
- Scalar inversion at φ^9 removes inertial mass entirely.
- Motion is a shift in resonance between lattice nodes.
- [Insert lattice transport diagram here]

12.5 High-Resonance Band (HRB) and High-Torsion Band (HTB)

- HRB (High-Resonance Band): $\varphi^1 \rightarrow \varphi^2 \rightarrow \varphi^3$ region governing electron buoyancy and drift.
- HTB (High-Torsion Band): $\varphi^3 \rightarrow \varphi^4 \rightarrow \varphi^5$ region governing proton torsion and compression.
- Both bands converge at $\varphi^6 - \varphi^7$ during fusion and emission thresholds.
- Bands are geometric consequences of the NLF.
- [Insert HRB/HTB band diagram here]

12.6 Scalar-Field Drop (ϕ^9 Endpoint)

- φ^9 is the inversion point where torsion collapses to scalar-field motion.
- Represents the upper harmonic limit where identity of particle dissolves.
- End-stage of the NLF continuum: lattice transport without inertia.
- [Insert scalar-inversion diagram here]